

**INDUCTOR CURRENT EMULATION CIRCUIT FOR SWITCHING POWER  
SUPPLY**

ABSTRACT OF THE DISCLOSURE

An inductor current emulation circuit for a switched-mode power supply (SMPS) which is arranged such that its inductor current ( $I_L$ ) goes to zero at least once per  
5 switching cycle. The emulation circuit includes an RC integrator connected in parallel across the inductor, and a zero reset switch (ZRS) connected in parallel across the integrator's capacitor. A control circuit operates the ZRS such that it is opened when  $I_L$  is non-zero, and is closed  
10 for a least a portion of the time during each switching cycle when  $I_L$  is zero such that the capacitor is substantially discharged. In this way, the ZRS essentially recalibrates the emulation circuit when  $I_L$  is zero. When so  
arranged, the voltage ( $V_C$ ) across the capacitor emulates  $I_L$ .  
15 The invention may be implemented with either a discontinuous-inductor-current SMPS, or a continuous-bipolar-inductor-current SMPS.